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southern latitudes. He described particularly a colony of these birds, which covers an extent of thirty or forty acres at the north end of the Macquarrie Island, in the South Pacific Ocean. The number of penguins collected together in this spot is immense; but it would be almost impossible to guess at it with any near approach to truth, as during the whole of the day and night, thirty or forty thousand of them are continually landing, and an equal number going to sea. They are arranged, when on shore, in as compact a manner, and in as regular ranks, as a regiment of soldiers; and are classed with the greatest order, the young birds being in one situation, the moulting birds in another, the sitting hens in a third, the clean birds in a fourth, &c.; and so strictly do birds in similar condition congregate, that should a bird that is moulting intrude itself upon those which are clean, it is immediately ejected from among them. The females hatch the eggs by keeping them close between their thighs; and, if approached during the time of incubation, move away, carrying the eggs with them. At this period the male bird goes to sea and collects food for the female, which becomes very fat. After the young is hatched, both parents go to sea and bring home food for it; it soon becomes so fat as scarcely to be able to walk, the old birds getting very thin. They sit quite upright in their roosting places, and walk in the erect position until they arrive at the beach, when they throw themselves on their breasts, in order to encounter the very heavy sea met with at their landing-place. Although the appearance of penguins generally indicates the neighbourhood of land, several instances were cited of their occurrence at a considerable distance from any known country.

SIMPLE SCIENCE—ASTRONOMY.

Astronomy is a knowledge of the heavenly bodies with regard to their magnitudes, motions and distances, whether real or apparent, and of the natural causes on which their phenomena depend.

The earth is a body, nearly circular, but not perfectly so, being flat at the poles. It moves round the sun in an orbit nearly circular, and in motion nearly equable in the space of $365^{\circ}\ 6^{h}\ 9'\ 11''$; and that the motion is not equable is easily accounted for by the attraction to the sun becoming greater the nearer it goes to it in its opaque orbit. The diameter of the earth is eight thousand miles, and it moves at the rate of nineteen miles in one second. The motion of the moon through the heavens, as well as her appearances at different times, are exceedingly remarkable. When she first becomes visible, at the time she is called *new moon*, she appears at the western part of the heavens, and seems to be at no great distance from the sun himself: every night she not only increases in size, but moves farther from the sun, until at last she appears in the eastern part of the horizon, just as the sun disappears in the western. After this she gradually moves farther and farther eastward; and, therefore rises every night later and later, until at last she appears to approach the sun as nearly in the east as she did in the west, and rises only a little before him in the morning, as in the first part of her course she set in the west not long after him. All these different appearances are completed in the space of a month, after which they begin in the same order as before.

The periodic time, that is, the time it takes to complete its revolution round the earth, is $27^{\circ}\ 7^{h}\ 43'$: and it is carried with the earth in its annual motion round the sun. The moon is not a planet, but only a satellite or attendant on the earth. Her diameter is two thousand miles, and her distance from the earth's centre two hundred and forty thousand miles; and she moves two thousand two hundred and ninety miles in one hour, and turns round her axes exactly in the time that she goes round the earth, which is the reason that she keeps always the same side towards us. The phases of the moon are particularly interesting. They prove it to be a spherical body, illuminated by the sun; therefore whilst that half of her which is towards the sun is enlightened, the other half is of course dark and invisible; hence she disappears when in conjunction or between us and the sun, because her dark side is then towards us: when she is gone a little way forward, we see a little of her enlightened side—a crescent—which is our new moon, which still increases to our view as she advances forward, until she becomes in opposition, (i. e. opposite to the sun,) and then her whole enlightened side is towards the earth, and she appears with a round illumined orb, which we call full moon. The moon has scarce any difference of season, her axis being almost perpendicular to the ecliptic: what is very singular, one half of her has no darkness at all—the earth constantly affording her a strong light in the sun's absence; while the other half has a fortnight light and a fortnight's darkness by turns. Our earth is thought to be a moon to our moon; waxing and waning regularly, but appearing thirteen times as large, and affording thirteen times as much light as she does us. Viewing the moon with a telescope, several curious phenomena offer themselves. A great variety of appearances is exhibited on her disc; there are spots differing very considerably in degrees of brightness. Many of the dark ones must necessarily be excavations on the surface, or valleys between mountains, from the circumstance of the shades of light which they exhibit. There is no reason to suppose that there is any large collection of water in the moon, for if there were, when the boundary of light and darkness passes through it, it must necessarily exhibit a regular curve, which is never observed. It is also probable, from the circumstance of no change being observed on her surface, such as would be produced by vapours or clouds.

That there are lunar mountains is strikingly apparent, by a variety of bright detached spots, almost always to be seen on the dark part, near the separation of light and darkness; these are tops of eminences enlightened by the sun, while their lower parts are in darkness; but sometimes light spots have been seen at such a distance from the bright part that they could not arise from the light of the sun. Doctor Herschell supposes these to be volcanoes —he measured the diameter of one and found it four miles.

Many astronomers formerly denied the existence of an atmosphere at the moon, principally from observing no variation of appearance on the surface, like what would take place did clouds exist, as with us; and also from observing no change in the light of the fixed stars on the approach of the dark edge of the moon; but astronomers now seem agreed that an atmosphere does surround her, although of exceedingly small density when compared with that of our earth. It has been measured by the paralax to be one thousand times rarer than ours, in which atmosphere the inhabitants of this earth could not live many seconds.

The cause of the tides is, the orb of the attracting power, which is in the moon, is extended as far as the earth, and draws the waters, acting upon places where it is vertical —insensibly on confined seas and bays, but sensibly on the ocean, whose beds are large, and when the waters have the liberty of reciprocation, that is of rising and falling—and the presence of the moon occasions an impulse which causes another in her absence. The sun's influence in raising the tides is but small in comparison to the moon's; for though the earth's diameter bears a considerable proportion to his distance from the moon, it is next to nothing when compared to its distance from the sun; and therefore the difference of the sun's attraction on the sides of the earth under and opposite to him, is much less than the difference of the moon's attraction on the sides under and opposite to her; and therefore the moon must raise the tides much higher than they can be raised by the sun.

The diameter of the sun is about 888,000 miles, and its distance from the earth 96,000,000 miles. It moves round its axis in $25^{\circ}\ 10^{h}$, and though to human eyes so extremely bright and splendid, it is yet observed, even through telescopes of but very small power, to have dark spots on his surface of various dimensions; one observed by Dr. Herschell was thirty thousand miles in diameter.—Every spot, if it continues long enough without being dissolved, appears to enter the sun's disc on the east side, and to go from thence with a velocity continually increasing, till it has gone half its way, and then to move slower and slower, till it has gone off at the western side, after which it disappears for about the space of time it spent in crossing the disc, and then enters on the east side again, nearly in the same place, and crosses it in the same track, and with the same unequal motion as before: these spots are not endowed with any permanency, nor are they at all regular in their shape, magnitude, or number, or in the time of their appearance or continuance. Some have been observed to arise and vanish in sixteen hours, while some have lasted seventy days: those spots that are formed gradually are gradually dissolved, while those that arise suddenly are suddenly dissolved. The nature and formation of the spots have been the subject of much speculation and conjecture. Some have thought that the sun is an opaque body, mountainous and uneven, covered all over with a fiery and luminous fluid; that this fluid is subject to edding and flowing, after the manner of our tides, so as sometimes to leave uncovered the tops of rocks or hills, which appear like black spots, and that the nebulosities about them are caused by a kind of froth: others imagined that the fluid which sends us so much light and heat, contains a nucleous, or solid globe, wherein are several volcanoes, which, like Ætna or Vesuvius, from time to time cast up quantities of bituminous matter to the surface of the sun, and form those spots that are seen thereon; and that as this matter is gradually consumed by the luminous fluid, the spots disappear for a time, but are seen to rise again in the same places when those volcanoes cast up new matter: a third opinion is, that the sun consists of a fiery luminous fluid, wherein are immersed several opaque bodies of irregular shapes, and that these bodies, by its motion, are sometimes raised up to the surface of the sun, where they form the appearance of spots, which seem to change their shape according as different sides of them are presented to view: a fourth opinion is, that the sun consists of a fluid in continual agitation; that by the rapid motion of the fluid some parts more gross than the rest are carried up to the surface of the luminary, like the scum of melted metal rising up to the top in a furnace. But Dr. Wilson's opinion has gained more credit than any of the foregoing; for he considers the spots to be hollows in the surface of the luminary, and has even observed the spots to be beneath the level of the sun's spherical surface: he considers that the vast body of the sun is made up of two kinds of matter very different in their qualities; that by far the greatest part is solid and dark; and that this dark globe is encompassed with a thin covering of that resplendent substance from which the sun would seem to derive the whole of his vivifying heat and energy. This supposition will afford a satisfactory solution of the appearance of the spots; because if any part of this resplendent substance shall by any means be displaced, the dark globe must necessarily appear.—The shining substance may be displaced by the action of some elastic vapour, generated within the substance of the dark globe. This is the general opinion of the astronomers of the present day.

Far the greater number of the celestial bodies preserve the same situation with respect to each other—and these are called fixed stars; and although these stars are the only marks by which astronomers are enabled to judge of the courses of moveable ones, yet they seem not to be endued with permanency, but to be perishable and destructible by accident, and likewise generable by some natural cause; and astronomers have supposed that every one of the innumerable multitude of fixed stars are suns, attended by planets and comets, each of which is an inhabitable world like our own, but of course invisible to us. The strongest argument for this hypothesis is, that they cannot be magnified by telescopes, on account of their extreme distance. Hence, therefore, we must conclude that they shine by their own light, and are as many suns; and those who have formed conjectures concerning their distance, thought that some of them were at least 400,000 times farther from us than we are from the sun; and, therefore, we may imagine an innumerable number of universes like to that which we can behold, and extending to infinity.

Besides the sun, earth, moon, and fixed stars, there are ten planets—named Mercury, Venus, Mars, Ceres, Palas, Juno, Vesta, Jupiter, Saturn, and Georgium Sidus. These are vast bodies revolving round the sun, in orbits nearly circular; some at less, some at greater distances than the earth: Jupiter has four satellites, which revolve round like our moon, and are enlightened by the sun. Saturn has seven, and the Georgium Sidus has six. They are all supposed to be surrounded by atmospheres like ours; and there are belts seen round Jupiter which are supposed to be clouds, but appear very permanent. Saturn is encompassed with a broad thin ring, which is exceedingly beautiful; through the space between the ring and the body, fixed stars have been seen. It is illuminated by the sun, and the surface of it appears more brilliant than the planet itself. It is distinctly divided into two parts, which are in the same plane, and revolve round their axis; the outside diameter of the larger ring is 200,000 miles; its width 6,700; the distance between the rings, 2,800; outside diameter of the smaller ring, 180,000, and its width 19,000. The ring is only 1,000 miles thick.

Comets are luminous bodies, occasionally appearing, and generally in the parts of the heavens not far from the sun; they do not appear long together—some only for a few days, others for a few months; but the most striking phenomenon, and what makes them objects of attention to all mankind, is the tail of light which they often exhibit. There have been many comets recorded in history, which are some of them supposed to have returned after a lapse of about ninety years; and calculations are hereby made as to when they may be expected again; but many have been expected which have never appeared. With respect to the tails of comets, little that is satisfactory can be offered in recording the various opinions on the subject. According to Sir Isaac Newton, they arise from a thin vapour, sent out from the comet by the heat of the sun, and supported in the solar atmosphere. Dr. Hamilton supposes the tails of the comets, the Aurora Borealis, and the elective fluid, to be matter of the same kind. According to his hypothesis, it would follow that the tails are hollow; and there is every reason to suppose this from the scarcely perceptible diminution of the lustre of the stars seen through them; but much is yet to be known on this subject.

By the discoveries which have been made in astronomy, we are permitted, as it were, to understand some of the counsels of the Great Creator of the universe. From these we can, from demonstration, overturn the absurd doctrine of blind chance. We see that a supreme intelligence placed and put in motion the planets about the sun in the centre—and ordained the laws of gravitation, having provided against the smallest imperfection that might arise from time: and let us not imagine that only in these vast bodies the supreme care was employed let us not imagine that man, apparently so insignificant, cannot be an object of attention in a world so incomprehensively vast—the protecting hand of the Creator is equally visible in the smallest insects and vegetables, as in the stupendous fabrics which astronomy points out to us. He who formed the human mind so different in its powers and modes of existence from the rest of the works of the creation, has assigned laws peculiarly suited to its preservation and improvement—laws not mechanical but moral—laws not obscurely seen by the light of reason, but fully illuminated by that of revelation.

H—N, T. C. D.

METHOD OF REMOVING HOUSES.

The practice of removing buildings on rollers, so as to widen streets without pulling down, which has been carried on with success for some years in New York, has been received with incredulity by those who have not the means of verifying the fact. Large stores have been carried back ten or a dozen feet—houses have been slewed round, to use a sailor's term, so as to face another street, and all this without in any way endangering the superstructure. When we wish to raise a house a story we unroof and build an attic, not so with brother Jonathan, he builds from the bottom.

We were admiring, says the New York *Star*—the ease and security with which the handsome two story brick